Design of Biogas Digester

1. According to Gas Storage

The design of biogas digester may vary accordingly to suit the requirements of the owner. This can be divided into three groups, namely: fixed-digester, floating gas holder and bag digester.

- **Fixed-Dome Digester**

Fixed-dome digester (Figure 9) is the most common type of design. The four major components of the digester which are gas storage, fermentation chambers, hydraulic tank and inlet tanks are integrated into one structure. Its distinct advantage over the other designs are:

1. All concrete construction, hence, durable and life long investment. Simple structure. Least cost.
2. No moving parts and metal components, thus, easy to maintain.
3. Capable of generating higher gas pressure (on the average 10 times higher than floating gas holder type) and does not use floating tank.
4. Completely constructed underground, thus save land space. Input materials flow easily into the digester by gravity, hence simplifying operation.

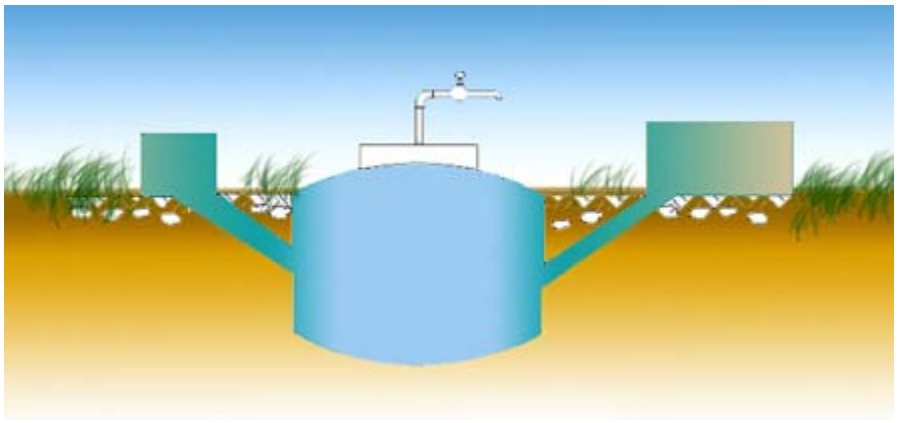


Figure 9. Fixed-Dome Type

- **Floating Gas Holder Digester**

The floating gas holder digester makes use of a floating tank for gas storage. This can be further subdivided into:

1. Top Floating Gas Holder Digester

   The floating tank (Figure 10) for gas storage is directly installed on top of the digester. This is usually employed for small size digester.

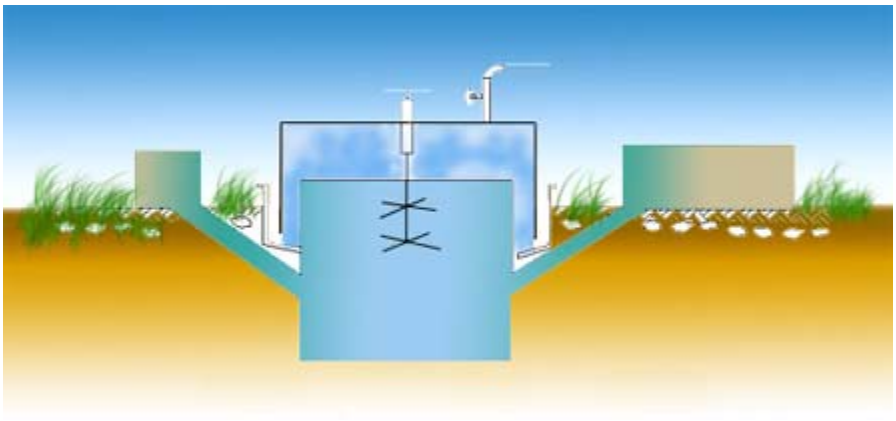


Figure 10. Floating Gas Holder Type Type

2. Separate Floating Gas Holder Digester

The application of this style is for medium to large size digester. There are two tanks involved: one is the fermentation tank and the other is the storage tanks.

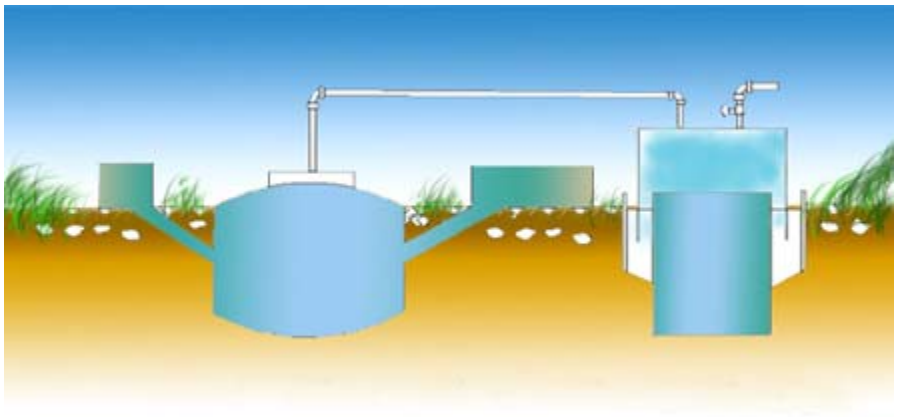


Figure 11. Separate Floating Gas Holder Type Type

- **Bag Digester**

The bag digester (Figure 12) is a type of digester with a separate bag for gas storage.

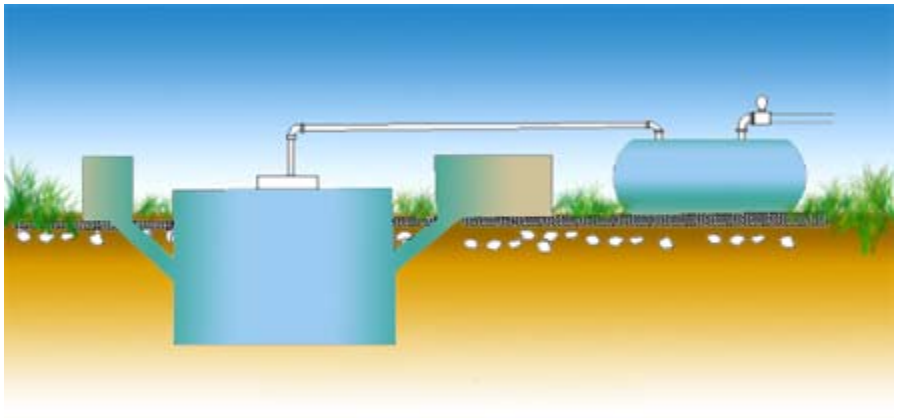


Figure 12. Bag Type Gas Holder

2. According to Geometrical Shapes

Biogas digester can be constructed in various geometrical shapes: vertical cylinder, spherical, rectangular, square, pipe-shaped, oval, spindle-shaped, elliptical, arch, oblate, etc.

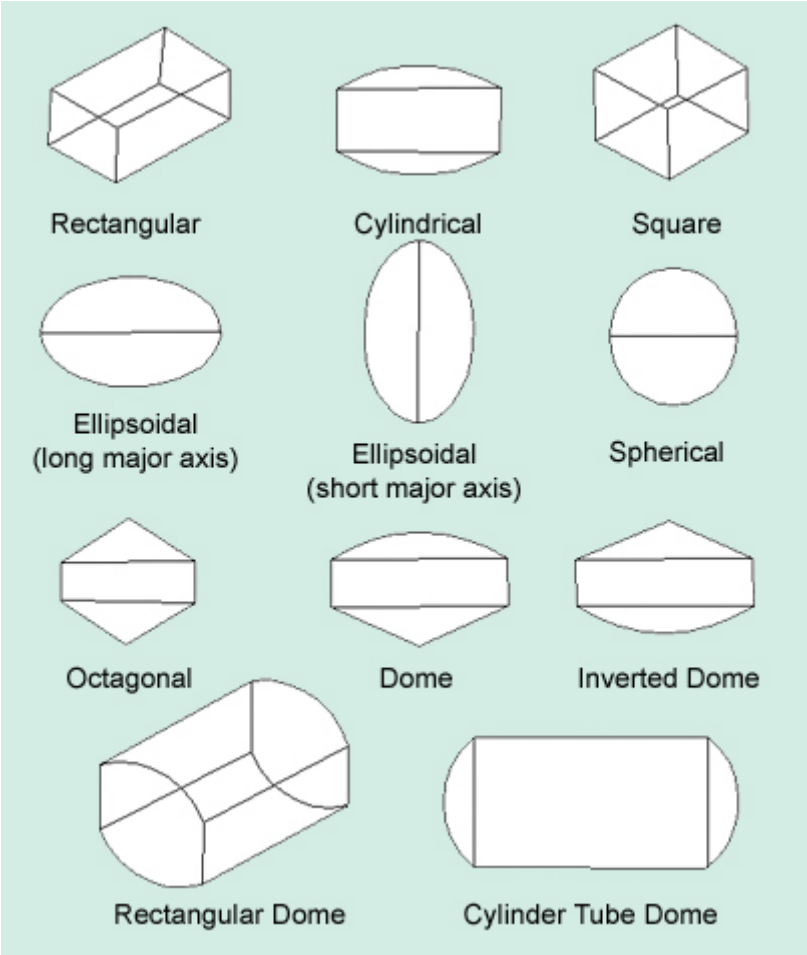


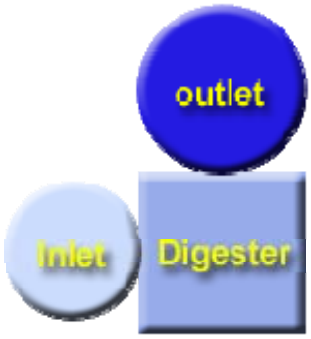
Figure 13. Design according to geometrical shape

3. According to Orientations of Inlet and Outlet

The arrangement of the different components of biogas system can be varied according to what is suitable to the condition of the area. The different orientations of inlet and outlet are shown in Figure 13 for design flexibility.

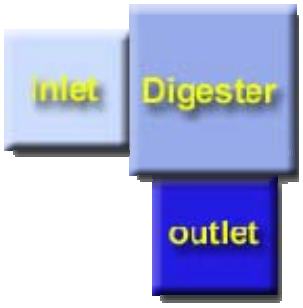
Option 1

Option 2



Option 3

Option 4



Option 5

Option 6

Figure 14. Design According to Orientations of Inlet and Outlet

4. According to Buried Position

Biogas digesters can be erected either of the following ways:.

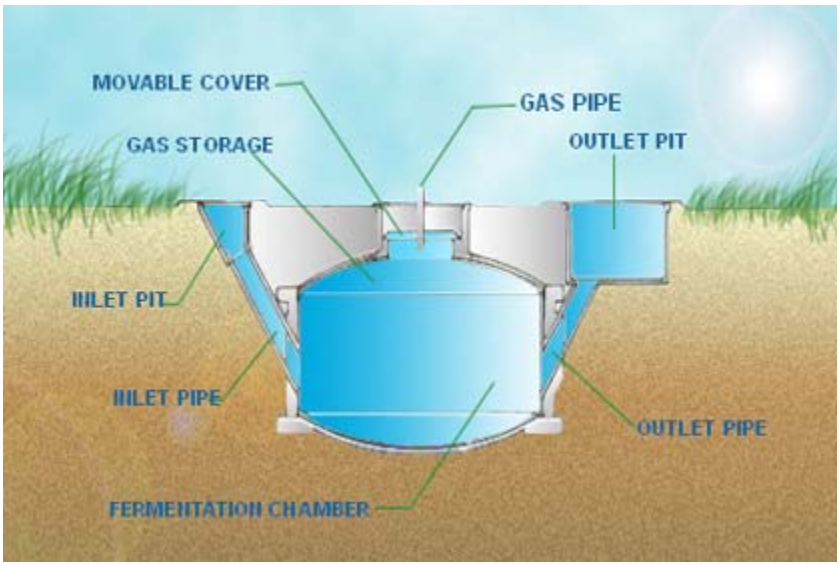


Figure 15. Under-ground digester

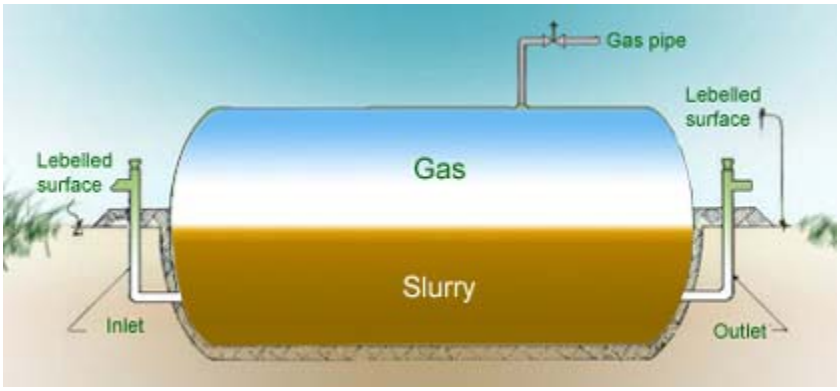


Figure 16. Semi-Buried digester

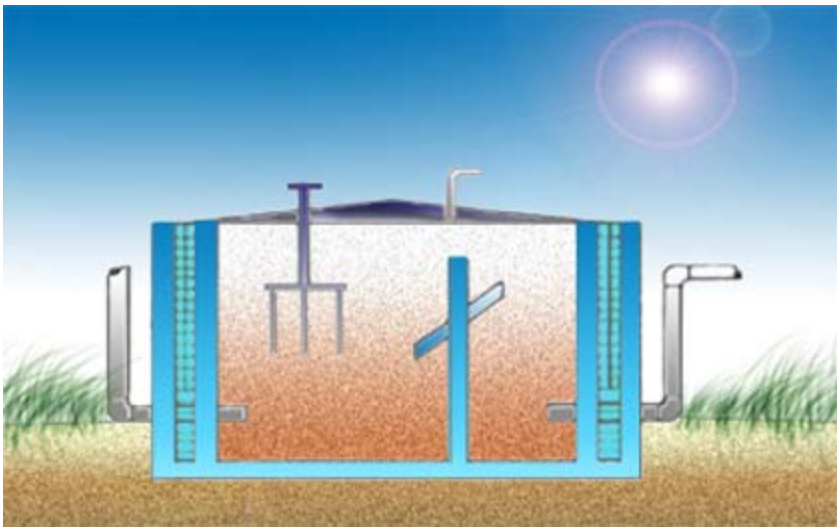


Figure 17. Ground digester